

IN THE CLAIMS

1. (currently amended) A hip prosthesis comprising a shaft which is implantable in the femur, a ball head anchored on the shaft, a socket in which the ball head has a slide pairing diameter and is movably supported, and a bipolar shell has a sliding pairing diameter and is placed between the ball head and the socket, whereby the ball head rotates in the bipolar shell and the bipolar shell rotates in the socket, wherein socket wherein the ratio of the diameters of the slide pairing diameter of the bipolar shell and the ball head is between 1.05 and 5.
2. (currently amended) The hip prosthesis according to claim Claim 1, wherein the ratio of the diameters of the slide pairing of the bipolar shell and the ball head is 5.
3. (currently amended) The hip prosthesis according to claim 1 Claim 2, wherein the slide pairing diameter of the bipolar shell is between 26 mm and 40 mm, the slide pairing diameter of the ball head is between 14 mm and 32 mm.
4. (currently amended) A hip prosthesis comprising a shaft which is implantable in the femur, a ball head anchored on the shaft, a socket in which the ball head has a slide pairing diameter and is movably supported, and a bipolar shell has a sliding pairing diameter and is placed between the ball head and the socket, whereby the ball head rotates in the bipolar shell and the bipolar shell rotates in the socket, wherein the ratio of the slide pairing diameter of the bipolar shell and the ball head is between 1.05 and 5 The hip prosthesis according to claim 1, wherein the wherein a ceramic ball head, the a ceramic bipolar shell, and the a ceramic socket are ceramic, wherein the tribological conditions of the ceramic components are defined as follows by a combination of the following features:
  - a) the hardness of the ceramic components is greater than 1,000 HV (Vickers);

- b) the surface finishes on the articulating surfaces of the ceramic components have a roughness less than 0.1  $\mu\text{m}$  ( $\text{Ra}$  value < 0.1  $\mu\text{m}$ );
- c) the contact angle between the articulating surfaces of the ceramic components is between 1° and 8° (measured in Ringer's solution); and
- d) the difference in the slide pairing diameters of the articulating surfaces of the ceramic components is between 1 and 200  $\mu\text{m}$ .

5. (previously presented) The hip prosthesis according to claim 1, wherein the centers of rotation of the ball head with respect to the bipolar shell, and of the bipolar shell with respect to the socket, have an offset (d) which is between 0.1 mm and 5 mm.

6. (previously presented) The hip prosthesis according to claim 1, wherein the bipolar shell in cross section has different wall thicknesses, the greatest wall thickness being provided in a region of an opening.

7. (previously presented) The hip prosthesis of claim 3, wherein said slide pairing ball diameter is 22.2 mm.

8. (previously presented) The hip prosthesis of claim 4, where said differences in the slide pairing diameters is between 20 and 120 microns.

9. (previously presented) The hip prosthesis of claim 5, wherein said offset (d) is between 1.5 and 2.5 mm.

10. (previously presented) The hip prosthesis according to claim 2, wherein the slide pairing diameter of the bipolar shell is 32 mm.

11. (currently amended) A hip prosthesis comprising a shaft which is implantable in a in the femur, a ball head anchored on the shaft, a socket shaft a socket in which the ball head is movably supported, and a bipolar shell consisting of a single material, wherein

the bipolar shell material is placed between the ball head and the socket, wherein whereby the ball head rotates in and directly contacts the bipolar shell and the bipolar shell rotates in the socket and wherein the bipolar shell is monolithic.

12. (currently amended) The hip prosthesis according to claim 4 Claim 1, wherein the ratio of the diameters of the slide pairing of the bipolar shell and the ball head is 5.

13. (previously presented) The hip prosthesis according to Claim 12, wherein the slide pairing diameter of the bipolar shell is between 26 mm and 40 mm, the slide pairing diameter of the ball head is between 14 mm and 32 mm.

14. (currently amended) A hip prosthesis comprising a shaft which is implantable in a femur, a ball head anchored on the shaft, a socket in which the ball head is movably supported, and a bipolar shell consisting of a single material, wherein the bipolar shell is placed between the ball head and the socket, wherein the ball head rotates in and directly contacts the bipolar shell and the bipolar shell rotates in the socket The hip prosthesis according to claim 11, wherein a ceramic ball head, a ceramic bipolar shell, and a ceramic socket, wherein the tribological conditions of the ceramic components are defined by a combination of the following features:

- a) the hardness of the ceramic components is greater than 1,000 HV (Vickers);
- b) the surface finishes on the articulating surfaces of the ceramic components have a roughness less than 0.1  $\mu\text{m}$  ( $\text{Ra}$  value < 0.1  $\mu\text{m}$ );
- c) the contact angle between the articulating surfaces of the ceramic components is between  $1^\circ$  and  $8^\circ$  (measured in Ringer's solution); and
- d) the difference in the slide pairing diameters of the articulating surfaces of the ceramic components is between 1 and 200  $\mu\text{m}$ .

15. (previously presented) The hip prosthesis according to claim 11, wherein the centers of rotation of the ball head with respect to the bipolar shell, and of the bipolar shell with respect to the socket, have an offset (d) which is between 0.1 mm and 5 mm.

16. (previously presented) The hip prosthesis according to claim 11, wherein the bipolar shell in cross section has different wall thicknesses, the greatest wall thickness being provided in a region of an opening.

17. (previously presented) The hip prosthesis of claim 13, wherein said slide pairing ball diameter is 22.2 mm.

18. (previously presented) The hip prosthesis of claim 14, where said differences in the slide pairing diameters is between 20 and 120 microns.

19. (previously presented) The hip prosthesis of claim 15, wherein said offset (d) is between 1.5 and 2.5 mm.

20. (previously presented) The hip prosthesis according to claim 12, wherein the slide pairing diameter of the bipolar shell is 32 mm.

21. (currently amended) The hip prosthesis of claim 11, wherein the ratio of the slide pairing diameter of the bipolar shell and the ball head is between 1.05 and 5. bipolar shell is monolithic.